

Nos. 22-1350, -1351

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IN THE  
**United States Court of Appeals for the Federal Circuit**

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APPLE INC.,

*Appellant,*

*v.*

COREPHOTONICS, LTD.,

*Appellee.*

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On Appeal from the United States Patent and Trademark Office,  
Patent Trial and Appeal Board  
Nos. IPR2020-00905 and IPR2020-00906

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**REPLY BRIEF OF  
APPELLANT APPLE INC.**

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## INTRODUCTION

As Apple demonstrated in its Opening Brief, the Board made numerous errors in rejecting Apple’s challenges to two sets of claims in the ’479 patent. In the -905 IPR, the Board distorted the claim language and ignored key aspects of the specification to adopt an overly narrow construction of the term “fused image with a point of view of the Wide camera.” Rather than construing the phrase to encompass an image with *either* the Wide position or Wide shape point of view (POV), the Board held the term to require an image with *both* the Wide position and the Wide shape. And in the -906 IPR, the Board elevated an inconsequential data-entry error to find Apple failed to carry its burden to show obviousness—despite Corephotonics never arguing that error was material to the question of patentability and without giving Apple a chance to respond to the Board’s reasoning.

Corephotonics’s response cannot overcome these errors. As to the -905 IPR, Corephotonics ignores the actual claim language. The claim term refers to “a point of view” of a “*fused* image.” Construing the actual language, there is no reason to constrain the disputed term to just one of the possible iterations of Wide POV set forth in the

specification. Corephotonics largely hangs its contrary construction on a newfound lexicography argument. But Corephotonics’s purported support in the specification does not refer to *fused* images, and the ’479 patent never defines Wide POV away from its ordinary meaning, much less clearly and unmistakably.

Because the Board’s finding of non-obviousness as to every claim in the -905 IPR rested on its improper claim construction, this Court must at a minimum reverse the Board’s claim construction and remand.

As to the -906 IPR, Corephotonics in its response brief never claims that it raised Dr. Sasián’s Abbe number mistake *as part of its non-obviousness argument* about the feasibility of scaling Ogata—because it didn’t. Instead Corephotonics insists, at various points, that it “pointed out” the mistake. But an aside in the background section, untethered to an obviousness argument that would be the same with or without the mistake, did not put Apple on fair notice that the Board would ignore the parties’ actual dispute and rule solely on that mistake. Moreover, as even Corephotonics cannot dispute, the Board erroneously claimed to find further errors in Dr. Sasián’s analysis where none existed; the Board’s further error tainted its non-obviousness holding.

A remand is required for the Board to address the parties' actual arguments, or at a minimum to clarify its reasoning.

## ARGUMENT

### **I. In The -905 IPR, The Board's Finding Of Non-Obviousness Rested On An Erroneous Claim Construction That Departed From The Term's Plain And Ordinary Meaning.**

As relevant to this appeal, there are two different aspects of POV, position and shape. OB8-9. The opening brief explained that the plain and ordinary meaning of the term “fused image with a point of view of the Wide camera” is not limited to images that retain *both* the position and shape POV of the Wide camera, but extends to images that retain *either* the Wide position POV *or* Wide shape POV. OB34-40. This is because the claim itself does not specify whether “Wide POV” must entail Wide perspective (shape) POV or Wide position POV; nor does it specify that the POV of a fused image must *solely* be from the Wide camera. OB35-36; Appx70 (13:40-50). To the contrary, the specification contemplates fused images with multiple possible iterations of Wide POV: only Wide position POV, only Wide perspective POV, or both Wide position and perspective POV. OB36-37; Appx66 (5:13-19).

Accordingly, the claim's reference to a “fused image with a point of view



(POV) of the Wide camera” does not limit the claim’s scope to situations where both Wide position and Wide shape are preserved. OB36-38; *Immunex Corp. v. Sanofi-Aventis U.S. LLC*, 977 F.3d 1212, 1218-19 (Fed. Cir. 2020).

Corephotonics does not argue its limiting construction is the plain and ordinary meaning of “a point of view of the Wide camera.” Instead, Corephotonics belatedly invokes the doctrine of lexicography: It claims for the first time on appeal that two sentences of the specification provide a “lexicograph[ic]” definition of the disputed term that may not be “overridden” by the ordinary meaning of the claim language. RB18. But Corephotonics falls short of the high bar for establishing that the specification clearly defines the disputed term away from its ordinary meaning. §I.A. In fact, Apple’s claim construction is more consistent with the claim language and specification as a whole. §I.B. Under the proper claim construction, this Court can find independent claims 1 and 23 (as well as dependent claims 10-14, 16, 18, 23, 32-36, 38, and 40) obvious in view of Parulski or remand to the Board to evaluate obviousness under the correct construction. §I.C. Either way, issues remain for remand, as the Board declined to address other obviousness

arguments as to other dependent claims involving different prior art references given its erroneous claim construction.

**A. The patent does not clearly define “fused image with a point of view of the Wide camera” away from its ordinary meaning.**

Corephotonics argues that nothing but “*the* point of view of the Wide camera” satisfies the claim language, requiring that “objects in the fused image retain *both* the positions *and* shapes that they have in the images [the Wide camera] photograph[s].” RB7-9 (first emphasis added). In Corephotonics’s view, “two sentences” of the specification are “lexicographic.” RB3; *see also* RB10-11, 18-21. Corephotonics is wrong.

To start, Corephotonics barely engages with the standard for establishing that a “patentee acted as his own lexicographer.” *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1370 (Fed. Cir. 2005). It is a high bar: A patentee must “clearly express th[e] intent” to “redefin[e] the meaning of particular claim terms away from their ordinary meaning.” *Id.* (“ambiguous” specification was not “clear enough ... to justify such a counterintuitive definition”); *GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (a patentee must “clearly set forth a definition” and “clearly express an

intent to define the term”). Otherwise, there is no basis to “depart[] from ... plain and ordinary meaning.” *GE Lighting*, 750 F.3d at 1308. The opposite is true here: As the Board found, the relevant portion of the specification was “not a model of clarity.” Appx11.

Indeed, the portion of the specification Corephotonics portrays as lexicographic does not define the term “*fused* image with a point of view of the Wide camera.” It states:

In a dual-aperture camera image plane, as seen by each sub-camera (and respective image sensor), a given object will be shifted and have different perspective (shape). This is referred to as point-of-view (POV).

Appx66 (5:10-13). As Corephotonics elsewhere acknowledges, this passage is not about *fused* images, let alone a fused image’s POV. It simply describes the high-level “concept” of POV. RB3.

Even “[i]f the paragraph ended there,” RB11, it does not support Corephotonics’s position. These sentences explain that every image captured by a lens has both position and shape POV. Apple does not dispute that; it explained the two aspects of POV in its opening brief and made clear that an image necessarily has both. OB8-10. This basic principle of optics and photography does not, however, explain what it

means for a “*fused* image” to have “a point of view of the Wide camera.” (emphasis added).

The next sentences of the specification go on to explain the importance of this “POV” concept when fusing together photographs taken from different sub-cameras: A fused “system output image” may have “the shape and position of either sub-camera image *or the shape or position of a combination thereof.*” Appx66 (5:13-15) (emphasis added). In other words, while the fused image (like all images) has both a shape and a position POV, each POV can come from either sub-camera, leading to multiple possible combinations. Corephotonics conveniently skips over this sentence as it walks through the specification language. RB10-11. But it is critical in context. As Apple explained (OB41), POV is straightforward when an image is first captured: “The Wide camera is going to capture an image with the Wide position and the Wide shape.” But the claim language speaks to a *fused* image, and after image fusion “position and shape do not necessarily go together.” *Id.*

In sum, Corephotonics’s chosen sentences of the specification do not identify from which sub-camera position and shape POV must be derived for the fused image to have “a point of view of the Wide

camera.” They therefore do not “set forth a definition” of the disputed claim term at all. *GE Lighting*, 750 F.3d at 1309. At a minimum, these sentences do not “clearly express an intent to define the claim term” such that it would meet the “exacting” standard for lexicography. *Id.* Absent any lexicography argument, the term’s plain and ordinary meaning controls. *Id.*

**B. Apple’s claim construction is the plain and ordinary meaning, which is confirmed by the claim language and specification.**

Moving beyond lexicography, Corephotonics tries to undermine Apple’s plain and ordinary reading of the claim language and the specification. Corephotonics fails at every turn.

1. Beginning with the claim language, the term at issue requires the fused image have “a point of view of the Wide camera”—not “the” point of view—as Corephotonics misleadingly suggests several times, including in its argument header. RB7, 9, 20. The claim’s use of the article “a” instead of “the” is meaningful here. OB36-38. If the claim language required “*the*” point of view of the Wide camera, Corephotonics might have a fair argument that *the* point of view of the Wide camera comprises both the Wide position and the Wide shape POV. But by

requiring a fused image to have “a” point of view of the Wide camera—particularly when the specification explains there are two types of POV and that a fused image can have Wide position POV or Wide shape POV or both—the claim is satisfied by a fused image with any of these permutations of Wide POV. There is no narrowing language to indicate otherwise. OB35-36; *cf. Scanner Techs. Corp. v. ICOS Vision Sys. Corp., N.V.*, 365 F.3d 1299, 1304-05 (Fed. Cir. 2004) (finding “no evidence of a clear intent ... to limit [‘an illumination apparatus’] to a single illumination source”).

Corephotonics protests that “perspective POV” and “position POV” are not sub-species “of a genus ‘POV,’” just as a “vice president” “is not a kind of ‘president.’” RB12. This argument misses the mark and ignores relevant context. Apple’s argument does not turn on some abstract “rule of the English language” that “placing one or more words at the front of a term necessarily indicates a species of the parent term.”

RB12. Apple’s reading of “Wide position POV” and “Wide perspective POV” flows directly from how a person of ordinary skill in the imaging arts would use the term “POV,” and from the specification: The concept of POV is explained by reference to its two sub-types, “shape” (or

“perspective”) and “position,” which can appear in different combinations in a fused image. Appx66 (5:10-18). The fact that perspective POV and position POV are the two sub-species of POV is also clear from the examples relied on by both parties to explain the concept of POV. OB8-10; RB7-8.

Thus the relevant “rule” of construction is provided by *Immunex*: Because there is no “express definition” of Wide POV or “language restrict[ing]” it to a single embodiment, it should be read as a “broad category” that includes each iteration or combination of Wide POV discussed in the specification. 977 F.3d at 1218-19; OB37-38. Of course it is true, as Corephotonics insists, that *Immunex* analyzed “specific uses of the relevant terminology in that patent’s specification.” RB18-19. But it stands for principles of claim construction that map directly onto this case. Like the “human antibodies” in *Immunex*, the claim term “Wide POV” should be interpreted as an umbrella category that may take more than one form, namely either Wide perspective or Wide shape POV.

2. Turning to the specification, Apple’s opening brief explained that the patent’s embodiments support its claim construction. OB38-39.

The specification contemplates two possibilities for fused images: In one embodiment, the Tele image is “shifted,” and the system then “register[s] Tele image pixels to a matching pixel set within the Wide image pixels.” Appx66 (5:24-34). This maintains both Wide position and perspective POV. *Id.* (5:30-34). In the other embodiment, the system performs its pixel-mapping registration without the preceding shifting step, resulting in a fused image with Wide position POV but not Wide perspective POV. *Id.* (5:24-26); Appx3910-3911 (Durand declaration). As Corephotonics told the Board, and repeats here on appeal, “registration [i]s not sufficient by itself to produce an image that preserves the shapes of objects from the wide image.” RB28. The claim does not require the shifting step, and so it should not be read to “require the exclusion” of an embodiment that does not involve shifting and therefore maintains only Wide position POV. *Immunex*, 977 F.3d at 1220; OB39.

Corephotonics offers a different reading of these embodiments, supposedly supported by a “parallel structure” that Corephotonics discerns by splitting the specification in two. RB13-16. According to Corephotonics, “register[ing] Tele image pixels to a matching pixel set



within the Wide image pixels,” Appx66 (5:23-26), retains both Wide perspective and Wide position. RB13-16. Corephotonics’s argument actually supports Apple’s position in several ways.

With respect to claim construction, assuming Corephotonics is right about its interpretation of the embodiment at issue (and it is not), then the specification describes an image containing both Wide perspective POV and Wide shape POV as having “*the* Wide POV.” Appx66 (5:26) (emphasis added). But as explained above (at 8-9), the disputed claim term is not *the* point of view of the Wide camera; it is *a* point of view of the Wide camera. If, as Corephotonics claims, the specification uses “*the* Wide POV” to refer to an image retaining both Wide position and Wide shape, that is all the more reason to treat the term “*a* point of view of the Wide camera” as referring to either Wide position POV or Wide shape POV. *Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012) (the use of “different terms in parallel settings” illustrates “that the two terms were not meant to have the same meaning”).

Moreover, if Corephotonics’s interpretation of this embodiment is correct (which it is not) and registering Tele image pixels to matching

pixels in the Wide image necessarily retains both Wide perspective and Wide position, then Parulski satisfies the claim limitation and the claims are invalid as obvious. *See infra* 21-24.

Corephotonics also offers an alternative response to the excluded-embodiment issue: Even if its construction excludes the relevant embodiment, that is immaterial, because embodiments would be excluded under Apple's construction too. RB20-22. Corephotonics further argues that any embodiments excluded under its construction are covered by claims 19-22, which "contain no 'POV' limitation." RB21-22. At most, Corephotonics's argument is that the excluded-embodiment factor is neutral and favors neither party. But Corephotonics is wrong. Claims 19-22 pertain to an image with a bokeh effect and include different image processing limitations than claims 1 and 23. Appx70-71 (14:66-15:67). There is no correspondence between an embodiment excluded by Corephotonics's construction of claims 1 and 23 and the embodiments claimed in claims 19-22.

As a last-ditch effort to defend its construction, Corephotonics notes that the "'presumption' against excluding disclosed embodiments" may be overcome by a "basis [for exclusion] in the intrinsic record."

RB21 (quoting *Nobel Biocare Servs. AG v. Intradent USA*, 903 F.3d 1365, 1381 (Fed. Cir. 2018)). But for this, Corephotonics once again relies on its flawed lexicography argument. Without that, there is no “basis” for overcoming the presumption.

Thus, whatever this particular embodiment means, Apple’s claim construction remains the better one as it is more consistent with the claim language and specification. *See supra* 3-4, 8-13.

3. The opening brief illustrated the Board’s error in relying on Figure 5 to limit the claims. OB43-45. The Board noted that the embodiment shown in Figure 5 results in an image with both Wide position and perspective POV, and from that determined that claim 1 must be read to require an image that retains both Wide position and Wide perspective POV. Appx12 (quoting Appx68 (9:46-58)). But the relevant image-processing steps in Figure 5 correspond to limitations disclosed in claims 5 and 6—not claim 1. OB44-45; Appx60, Appx70 (13:64-14:4). There was therefore no basis to limit claim 1 based on the embodiment in Figure 5. *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1383 (Fed. Cir. 2008) (noting “[i]t is often the case that different claims are directed to and cover different disclosed

embodiments,” and refusing to limit claims to illustrated embodiment); *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1277 (Fed. Cir. 2008) (dependent claims “do not restrict the construction of” independent claim); *cf.* OB44.

Corephotonics does not seriously endeavor to defend the Board’s reliance on Figure 5. It admits that Figure 5 “is not, by itself, conclusive evidence” of the proper claim construction, instead arguing it “supports” the Board’s construction when read “together with the lexicography.” RB23. But Corephotonics’s lexicography argument fails. *Supra* 5-8. There is accordingly no way to gloss over the serious problems with the Board’s analysis of Figure 5.

Corephotonics also misunderstands Apple’s argument (at OB45) that the Board’s claim construction would render claim 6 superfluous. RB23-24. On the Board’s view, it is the “decision” step (510) of Figure 5 that compels an output necessarily preserving both Wide perspective and Wide position POV. OB43-45 (discussing Appx12). The relevant portion of that step corresponds to dependent claim 6—in which any discrepancies between Wide and Tele image pixels are resolved in favor of the Wide image. Appx68 (9:51-58); Appx70 (14:1-4). Elsewhere, Corephotonics concedes this step is required to retain both Wide

position and shape. RB28. Thus, for claim 1 to result in an image retaining both Wide position and shape, it would have to encompass this step—rendering claim 6 “superfluous.” OB44-45.

Altogether, Corephotonics provides no convincing reason this Court should distort the claim language or close its eyes to anything beyond the “two sentences” of the specification Corephotonics relies on. A “fused image with a point of view of the Wide camera” need not match the position *and* shape as initially captured by the Wide camera to meet the claim limitation. As the claim language and specification make clear, there are multiple versions of fused images with a Wide POV. Accounting for these requires the Court to construe “a fused image with a point of view of the Wide camera” to include fused images with Wide position POV, Wide perspective POV, or both.

**C. This Court may resolve or remand any remaining questions regarding whether Parulski satisfies the claim limitation.**

The Court should at a minimum reverse the Board’s claim construction and remand the -905 IPR to the Board. *Kaken Pharm. Co.*

*v. Iancu*, 952 F.3d 1346, 1354-55 (Fed. Cir. 2020).<sup>1</sup> But as Apple’s opening brief explains, OB46-53, the Court may reverse the Board’s finding of non-obviousness as to independent claims 1 and 23 (and dependent claims 10-14, 16, 18, 32-36, 38, and 40) because there are no factual disputes about whether Parulski renders them obvious under the proper claim construction. *See* Appx13 (Ground 1 of -905 IPR Petition). Indeed, much as it tries to walk back the concession now, Corephotonics has even conceded that Parulski satisfies the wide POV limitation under its incorrect claim construction. OB53-55.

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<sup>1</sup> Corephotonics mistakenly asserts that Apple has “forfeited” any challenge to the Board’s finding of non-obviousness as to dependent claims 2-4, 5-9, 15, 24-26, 27-31, and 37, which involve different prior art references than those at issue on appeal. RB2. But as Corephotonics recognizes, “[t]he Board’s decision did not address” arguments particular to these claims, having resolved all grounds for invalidity on the basis of its improper claim construction. RB25; Appx22. Because there “was no Board fact finding to appeal” as to whether those dependent claims are obvious in light of the additional prior art under the proper claim construction, Apple did not forfeit any arguments as to these claims. *Long v. McDonough*, 38 F.4th 1063, 1065 n.1 (Fed. Cir. 2022). The Board will have to consider those additional grounds for invalidity on remand.

**1. Parulski teaches outputting a fused image that maintains a Wide point of view under the proper construction.**

When “uncontested findings regarding [the prior art] render [the claims] obvious under the proper [construction],” this Court may address obviousness without a remand. OB46-47 (quoting *Praxair Distrib., Inc. v. Mallinckrodt Hosp. Prods. IP Ltd.*, 890 F.3d 1024, 1036-37 (Fed. Cir. 2018)). Corephotonics attempts to distinguish cases like *Praxair* and *Carrum Technologies, LLC v. Unified Patents, LLC*, No. 20-2204, 2021 WL 3574209 (Fed. Cir. Aug. 13, 2021), in which this Court has taken that approach. RB29-31. But Corephotonics acknowledges that in both cases, reversal was appropriate because the Board had made the “factual findings necessary to decide obviousness under the correct construction.” RB30. That is the case here.

Contrary to Corephotonics’ claim, there are no “issues of fact that the Board has not addressed and that make reversal improper.” RB31. Corephotonics acknowledges that Parulski teaches “creating a range map” through “pixel matching.” Appx605 (36:20-21); Appx607 (38:14-21). It acknowledges that Parulski’s range map may be used to combine Tele and Wide images data. Appx607 (38:4-10); Appx622 (53:17-20). It

even conceded that Parulski teaches a “fused image” with “the wide position, [and] the tele perspective.” Appx622 (53:17-19).

Corephotonics’s only argument is that Parulski does not expressly teach use of pixel-matching *directly* to output a “fused” image, even if it does teach both pixel-matching and image fusion. RB31. In its view, pixel-matching to create the range map as an interim step does not satisfy the claim limitations because “there’s no rejection of pixels that don’t match.” Appx622 (53:11). It claims the Board should be given the chance to consider this issue.

This argument may be rejected as a matter of law. For one thing, it is predicated on an erroneous claim construction. The limitation Corephotonics claims is absent from Parulski—pixel rejection—is present in claim 6, not claim 1. *See supra* 14-16. Moreover, *General Electric* explained that one need not show “motivation to combine each element of the claim” when the claims are “present together in a reference,” concluding a contrary rule would “unduly dissect[] prior art references.” *Gen. Elec. Co. v. Raytheon Techs. Corp.*, 983 F.3d 1334, 1352 (Fed. Cir. 2020). Corephotonics responds with dicta from *In re Stepan Co.*, 868 F.3d 1342, 1346 n.1 (Fed. Cir. 2017), in which the Court



noted in passing that “[w]he[n] a rejection is based on ... combining multiple embodiments from a single reference, ... there must be a motivation to make the combination.” Corephotonics takes the language from *In re Stepan* out of context: This Court reversed a finding of obviousness where the Board had determined that a person of ordinary skill in the art would arrive at the claimed invention by *modifying* the prior art with “routine optimization.” *Id.* at 1346. Here, no modifications are required. As in *General Electric*, all of the elements of the claim are “present together” in Parulski. Moreover, Corephotonics’s argument is factually incorrect: Parulski provides numerous examples where the range map created via pixel-matching is used to create a fused image. OB51-53.

Nor does it matter that the Board did not discuss the supposed objective indicia of non-obviousness that Corephotonics raised. RB33-34. Such considerations “generally do not overcome a strong prima facie case of obviousness,” like that here. *W. Union Co. v. MoneyGram Payment Sys., Inc.*, 626 F.3d 1361, 1373 (Fed. Cir. 2010) (finding secondary considerations “inadequate to establish nonobviousness as a matter of law”); *Ohio Willow Wood Co. v. Alps S., LLC*, 735 F.3d 1333,

1344 (Fed. Cir. 2013) (“[W]here a claimed invention represents no more than the predictable use of prior art elements according to established functions ... evidence of secondary indicia are frequently deemed inadequate to establish non-obviousness.”).

In summary, the Court has ample authority to reverse the Board’s obviousness finding on independent claims 1 and 23 (and dependent claims 10-14, 16, 18, 32-36, 38, and 40). And as Corephotonics does not dispute, if the Court adopts the correct claim construction, at least a remand is required.

**2. Parulski teaches the claim term even under the Board’s construction.**

Corephotonics conceded before the Board that Parulski teaches the claim limitation even under the Board’s improper construction. OB53-55. And its arguments on appeal double down on that concession. In Corephotonics’ view, “registering pixels to matching pixels will *necessarily* address both position (shift) and perspective (shape).” Appx414; RB17 (the process of “registering pixels to the original [W]ide ... image” will result in “an image that retains both the positions *and* shapes of the [Wide] image”). Meanwhile, Corephotonics has recognized that Parulski teaches this pixel-registration process: mapping Tele

image pixels to a matching pixel set within the Wide image. *See supra* 18-19; Appx607 (38:20-21); Appx1993 (20:1-15). Therefore, Parulski’s pixel-mapping process retains Wide POV under the Board’s construction requiring both Wide position and Wide shape POV.

Corephotonics first protests that Apple did not make this argument before the Board. RB26. But Corephotonics made the relevant concession in its sur-reply, and Apple then raised it at the first opportunity at its hearing before the Board. Appx589 (20:2-15). Thus, this is not a new argument and Corephotonics has had opportunities to respond both here and before the Board. If the Court agrees with Corephotonics’ claim construction, the Court should hold Corephotonics to its concession about the implications of that construction. OB53-54.

Corephotonics next attempts to minimize the significance of its concession. Corephotonics claims that in the relevant sur-reply passage (Appx414) it referred only to the process of “registering pixels to matching pixels” described in column 5 of the ’479 patent, not the process of registering pixels “generally.” RB27. It is unclear what Corephotonics means by this. Column 5 describes the process of registering pixels to matching pixels generally: “In fused images, it is

possible to register Tele image pixels to a matching pixel set within the Wide image pixels, in which case the output image will retain the Wide POV.” Appx66 (5:23-26). Corephotonics does not explain how this broad discussion in column 5 undermines its concession in any way.

Corephotonics further suggests that even if the registration of Tele to Wide image pixels were to necessarily “*address*” both position and perspective POV in every system, it may not *maintain* the Wide position and perspective POV because pixel-matching is “just one step of several in a process that results in the fused image.” RB28.

Corephotonics specifically invokes Figure 5, arguing that “error detection and rejection steps are required in order to preserve both shapes and positions.” RB28 (quoting Appx621-622). Corephotonics’s argument on this score reinforces Apple’s claim construction argument. The error-detection and rejection steps Corephotonics invokes as necessary to retain both Wide shape and position POV are depicted in Figure 5, Appx60, and recited in claims 5 and 6 of the patent, Appx70 (13:64-14:4). If those steps are required to create a fused image retaining both shape and position POV, RB28, then claim 1—which does not recite those steps—cannot be understood to recite a process for

creating a fused image that retains both shape and position POV as Corephotonics contends. *See supra* 14-16, 19. That is why this Court should reject Corephotonics’s claim construction. But if the Court disagrees and construes claim 1 to superfluously encompass the further limitations recited in claims 2 through 6, illustrated in Figure 5, then Corephotonics should be held to its concession that “registering pixels to matching pixels will *necessarily* address both position (shift) and perspective (shape).” Appx414; OB54-55.

Thus, even if this Court affirms the Board’s claim construction, it should reverse the Board’s non-obviousness finding on independent claims 1 and 23, or at a minimum set aside the Board’s finding that Parulski does not teach the Wide POV limitation and remand for the Board to reconsider its decision.

## **II. In the -906 IPR, The Board’s Decision Violated The APA And Is Unsupported By Substantial Evidence.**

Parulski teaches a dual-aperture camera and image processing techniques, but not the physical properties of each camera assembly. OB57. Ogata teaches the specifics of the wide camera lens and discloses lenses used in traditional 35mm cameras. OB57-58; Appx2717. Apple’s expert, Dr. Sasián, used standard lens design software (Zemax) to

demonstrate that the Ogata lenses could be scaled down to work in Parulski's smaller camera. In response, Corephotonics claimed that conventional lenses simply cannot be scaled down to miniature size, so Apple had not demonstrated a reasonable expectation of success in scaling the Ogata lenses. Corephotonics's carefully worded response brief to this Court cannot mask the fact that this argument had nothing to do with an immaterial data-entry error in the Zemax software involving the Ogata lens's Abbe number, mentioned only once in passing in the background section of Corephotonics's Patent Owner response. The Board erred in skirting the actual dispute between the parties to base its decision on errors (real or imagined) in Dr. Sasián's Zemax data.

**A. The Board violated the APA by basing its ruling on an argument Corephotonics did not advance and of which Apple lacked fair notice.**

As recounted in the opening brief, Apple argued to the Board that a person of ordinary skill in the art would have combined the Ogata and Parulski references to achieve the invention claimed in the '479 patent, rendering that patent invalid as obvious. OB57-61. Specifically, Apple explained that the Ogata lens could be scaled down to fit in the smaller

Parulski camera, citing both Dr. Sasián's declaration and Smith's *Modern Lens Design* textbook. Appx746-751, Appx753-757.

Corephotonics argued in response that it is not possible or feasible to scale a lens by the factor at issue to miniature size, and thus a person of ordinary skill would have used specialized miniature lenses in Parulski's camera, rather than scaling down the lens disclosed in Ogata. Appx940-946, Appx959; OB58. Completely untethered to that argument, Corephotonics identified a data-entry error as to the Abbe number in Dr. Sasián's Zemax analysis. Appx932; OB59. Apple responded to Corephotonics's actual argument, explaining that because neither Parulski nor the '479 patent claimed a *miniature* camera, Corephotonics's statements about the feasibility of scaling lenses to miniature size had nothing to do with scaling Ogata for use in Parulski. OB60.

Corephotonics's response brief does not, and cannot, dispute the substance of this procedural history. So it describes the same events to subtly imply some connection between the Abbe number mistake and its non-obviousness argument about miniature cameras. Corephotonics begins by emphasizing that it "clearly and expressly raised" the

argument “that Apple had failed to demonstrate ... a reasonable expectation of success” in scaling down the Ogata lens for use in Parulski. RB35; *see also* RB5, 47. This is not in dispute; Apple acknowledges that Corephotonics responded to Apple’s obviousness argument with an argument of its own. The issue on appeal is this: What was the reason Corephotonics gave as to *why* Apple had supposedly failed to demonstrate a reasonable expectation of success? Corephotonics argued to the Board, and reiterates on appeal, “that scaling lens designs *by the factors proposed by Apple ...* was not likely to succeed.” RB36 (emphasis added).

That argument has nothing to do with the Abbe number data-entry mistake. Appx932, Appx940-946; OB57-61. Even now, the most Corephotonics can say is that it “*pointed out* that Apple’s expert ha[s] made an error in conducting his lens design software analysis.” RB5 (emphasis added); *see also* RB7 (Corephotonics “pointed out” “the issue”); RB42 (“Corephotonics pointed out Dr. Sasián’s error”). But “point[ing] out” an error as an aside in the background section of a brief is a far cry from arguing that the error has any material significance. Corephotonics never actually claims in its response brief that it raised



the Abbe number mistake *as part of its argument* about “the lack of a reasonable expectation of success,” RB5—because it did not. The record belies Corephotonics’s current attempt to draw some causal link between the Abbe number mistake and its non-obviousness argument. The issues were entirely unconnected.

Corephotonics’s argument on appeal confirms as much. The response brief begins by detailing the evidence it presented to the Board to support its argument that “[a] traditional objective lens *can not [sic] be simply scaled down.*” RB37 (citing Appx5076). It then devotes several pages to refuting Apple’s claim that a 1/2.5” sensor is not miniature. RB38-40. These issues were not addressed by the Board and have nothing to do with the Abbe number issue—they relate to the argument Corephotonics actually made below, highlighting Corephotonics’s real matter of concern. The merits of those arguments should be addressed by the Board on remand.

Corephotonics then raises new arguments for the first time on appeal. For example, Corephotonics claims that “[s]omething more than [the Smith textbook] is required to show an expectation of success, and given Dr. Sasián’s erroneous and uncorrected analysis, Apple has

no other reliable evidence to offer.” RB45. The result, Corephotonics argues, is that Dr. Sasián’s error prevents Apple from making a *prima facie* case of obviousness. RB1-2, 35, 48. But these are arguments Corephotonics *didn’t* make below. Had Corephotonics argued before the Board that Dr. Sasián’s mistake undermined Apple’s *prima facie* case of obviousness as it now claims, RB48, Dr. Sasián could have corrected the data-entry mistake and demonstrated that the scaling still works as expected.

Corephotonics says that “Apple simply failed to address” this argument. RB7. Apple did not respond to this argument because Corephotonics never made it. To be clear, the problem is not that Corephotonics did not devote sufficient space in their Patent Owner Response to the Abbe number mistake. *Cf.* RB47. It is that the Abbe number mistake was never raised as a non-obviousness argument. Instead, it was mentioned in the background section of the brief as an aside, untethered to the actual arguments made in Corephotonics’s submission (which would have been exactly the same even if Dr. Sasián hadn’t made a data-entry mistake). Thus, the Board did not just “focus[] on issues the parties had treated as less important.” RB48-49.

It did not address the parties' arguments at all and instead transformed a background aside into a dispositive argument, with no notice.

Corephotonics's extended discussion of the cases cited in Apple's opening brief on this point, RB48-51, cannot mask these facts. Those cases show nothing more than the unsurprising fact that the particulars of the Board's errors requiring remand are different in each case. Notably, Corephotonics does not even attempt to distinguish (or even acknowledge) *Power Integrations, Inc. v. Lee*, 797 F.3d 1318 (Fed. Cir. 2015), or *Google LLC v. Conversant Wireless Licensing S.A.R.L.*, 753 F. App'x 890 (Fed. Cir. 2018), which are squarely on point. Here, as in those cases, the Board "focused on a red herring" and thus "failed to adequately evaluate [the parties'] primary argument[s]." *Power Integrations*, 797 F.3d at 1325. Because Corephotonics never argued to the Board that Dr. Sasián's Abbe number mistake undermined Apple's prima facie case on obviousness or was otherwise material in any way to the obviousness inquiry, the Board's decision on that basis is without fair notice to Apple and requires a remand. OB61-64; *Power Integrations*, 797 F.3d at 1325; *Google*, 753 F. App'x at 895.

**B. The Board's decision is not supported by substantial evidence.**

Even setting aside the fact that Corephotonics never argued that the Abbe number mistake was material, the Board's finding that Apple failed to show obviousness is not supported by substantial evidence. The Abbe number mistake simply cannot bear the weight the Board placed on it.

Defending the Board, Corephotonics claims that "the Abbe number error itself renders Dr. Sasián's lens-performance calculations for the scaled Ogata inaccurate." RB46. That statement is incomplete. As explained in the opening brief, the Abbe number mistake affects only a few of the Zemax output calculations—not all of them. OB59, 69. An Abbe number relates to the material from which a lens is made, and signifies how light is refracted through a lens. OB14 & n.2. It has nothing to do with the field of view, focal length, or f-number of a lens, *id.*, which are the lens characteristics Dr. Sasián addressed in his declaration as relevant to scaling. OB17, 61. Relatedly, none of the lens properties Corephotonics's expert claimed were affected by the Abbe number mistake were relied on by the parties below. OB59, 61, 69. Thus, the Abbe number mistake did not affect the Zemax lens

calculations *in relevant part*, and there is no reason to discount the portions of the Zemax analysis unaffected by Dr. Sasián’s error—that is, the portions relevant to the scalability question.

The Board further erred in concluding that Dr. Sasián’s analysis was the *only* support for Apple’s position. OB68. As explained in the opening brief, Apple relied on both Dr. Sasián’s analysis and the Smith reference to support its conclusion. OB68. Corephotonics concedes as much. RB41 (“Apple’s petition relied on the Smith textbook and Dr. Sasián’s declaration together....”); RB43 (similar). Corephotonics therefore must also concede that the Board’s premise for its decision in the -906 IPR—that Apple’s scaling analysis is “entirely based on Dr. Sasián’s opinion,” Appx40—is wrong. Thus, even if some (but not all) aspects of Dr. Sasián’s Zemax analysis are inaccurate, the question remains as to whether, in light of Smith and the aspects of the Zemax analysis unaffected by the Abbe number error, Apple has showed a reasonable expectation of success in scaling the Ogata lens for use in the Parulski camera. That is a question the Board should address on remand.

**C. At a minimum, the Board’s erroneous finding of error requires a remand.**

As Apple explained in its opening brief, the Board claimed to identify, *sua sponte*, an error in Dr. Sasián’s Zemax analysis that was not error at all. OB65-67. Specifically, the Board stated there were “inconsistencies” in the aspherical surface data between the Ogata reference and Dr. Sasián’s Figure 3C. OB65-66. But these supposed “inconsistencies” were actually Zemax scaling the lens prescription data in precisely the way it is supposed to—not error. OB66-67.

Even Corephotonics does not defend the Board’s baseless conclusion that this was a mistake on Dr. Sasián’s part. RB45-46. Instead, Corephotonics tries to downplay the Board’s error, claiming that “[t]he additional discrepancies ... did not form a basis of the Board’s conclusions.” RB7; *see also* RB46. This argument misapprehends the record.

Far from addressing the two supposed errors in Dr. Sasián’s Zemax data “independently,” RB46, the Board repeatedly considered them together, without distinction. The Board began by identifying both errors in the same paragraph in its final written decision. Appx39. In one sentence, it noted the Abbe number mistake, *id.*, which everyone

agrees was a genuine data-entry error. OB59; RB46. And in the very next sentence, the Board identified a supposed error in “the data for the fourth and tenth aspherical surfaces,” Appx39—a nonexistent error, OB65-67.

The Board continued discussing both errors, without differentiation, in its analysis. For example, the Board stated that “as noted above, the lens prescription data used for that analysis appears to differ from the lens prescription data for Ogata’s first embodiment lens,” Appx40-41—referring back to the earlier paragraph addressing *both* errors together. And the Board ultimately found, “based on the erroneous data discussed above,” Appx40, that Dr. Sasián’s analysis was unreliable. Appx41. Although the Board engaged in some additional discussion of the Abbe number mistake, Appx39, Appx41, its ultimate finding that Dr. Sasián’s analysis was unreliable is not limited to that mistake. At minimum, the decision is ambiguous and “it is not clear if the basis for the Board’s decision” was the Abbe number error standing alone, or both errors it purported to identify. *Apple Inc. v. Corephotonics, Ltd.*, 861 F. App’x 443, 452 (Fed. Cir. 2021); *see also id.* (“[T]his is not a situation where we can reasonably discern that the

Board was relying on multiple, independent grounds to support its finding.”).

Where, as here, the Board’s decision is not clearly predicated on independent grounds, errors on related grounds cannot be casually discarded as “immaterial,” as Corephotonics claims. RB46. To the contrary, if the Board’s decision “is premised to some extent on erroneous or irrelevant subsidiary findings,” the question is not “whether the [Board] *could* have reached the same conclusion absent the impermissible consideration, but ... whether the [Board] *would* have reached the same conclusion.” *Campbell v. Merit Sys. Prot. Bd.*, 27 F.3d 1560, 1570 (Fed. Cir. 1994).

It is accordingly not enough that “the Abbe number error itself renders Dr. Sasián’s lens-performance calculations for the scaled Ogata inaccurate,” as Corephotonics claims. RB46. The question is whether the Board would have viewed Abbe number data-entry error, if considered alone, as so severely undermining the reliability of Dr. Sasián’s analysis that it warranted ruling on that basis, instead of addressing the parties’ broader dispute about scalability. And on that front, the Board could well have viewed a single data-entry error no one



viewed as important differently than an expert analysis it (erroneously) deemed rife with error.

Based on the foregoing, this Court cannot affirm the Board's tainted finding of non-obviousness. At minimum, a remand is required for the Board to evaluate non-obviousness without reliance on non-errors in Dr. Sasián's analysis. In other words, the Board must consider whether the Abbe number error, standing alone, undermines Apple's showing of obviousness and therefore justifies its decision—and if not, to consider the parties' other arguments. *Apple*, 861 F. App'x at 452-53 (citing *Hermes Consol., LLC v. E.P.A.*, 787 F.3d 568, 571 (D.C. Cir. 2015)).

### CONCLUSION

This Court should reverse or remand the -905 and -906 IPRs for further proceedings.

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## **CERTIFICATE OF COMPLIANCE**

The brief complies with the type-volume limitation of Fed. Cir. R. 32(b)(1) because this brief contains 6,982 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(f) and Fed. Cir. R. 32(b)(2).

This brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type style requirements of Fed. R. App. P. 32(a)(6) because this brief has been prepared in a proportionally spaced typeface using Microsoft Word for Microsoft 365 in Century Schoolbook 14-point font.

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